No. 56 March, 1961

ONTARIO

FISH AND WILDLIFE MANAGEMENT REPORT

DEPARTMENT OF LANDS AND FORESTS
FISH AND WILDLIFE BRANCH

(These Reports are for Intra-Departmental Information and Not for Publication)

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(THESE REPORTS ARE FOR INTRA-DEPARTMENTAL INFORMATION AND NOT FOR PUBLICATION)

REPORT ON OPENING OF DUCK SEASON ON OCTOBER 1, 1960 IN LAKE SIMCOE DISTRICT

by
A. A. Wainio, R. H. Trotter and J. S. Ellis

Abstract

For the second year running personnel from various sections of the Department in the Lake Simcoe District assisted the Fish and Wildlife Staff in covering the opening of the duck season in Holland Marsh. All access points into the Marsh were patrolled. The hunters were very satisfied with the coverage and proved very helpful in supplying information. This year in the Marsh 269 hunters shot 278 ducks giving a hunter's success of 1.03. The hunter's success for 1959 in the same area was .56. A similar complete coverage was carried out on opening day in Matchedash Bay. Here 162 hunters checked had bagged 125 ducks for a hunter's success of .77 ducks per hunter. In 1959 the hunter's success was 1.4.

Holland Marsh

For the second year running a complete coverage was carried out in Holland Marsh for the opening of duck season on October 1, 1960. The Department recruited some of the Conservation Officers and many regular staff members from Parks, Timber (Reforestation), County Forests and the Severn River Management Unit. Also, the R.C.M.P. patrolled Cook's Bay and the Lake.

All access points into the marsh were manned. At these points the personnel in charge were to warn the hunters of the opening time of 12 noon and they were also to try and hold back the hunters from entering the marsh until around 11:30 a.m. The department personnel were at their posts at 6:00 a.m. Saturday morning. From these officers the hunters received a sheet stressing the opening time, closing time and daily bag limit.

There were very few violations. The hunters were quite satisfied with the thorough coverage and supervision of the marsh. Many expressed the hope that it would always be like this. Those hunters with boats were permitted to bring them into the marsh around 9:00 a.m. as long as they left their guns behind them in their cars.

Some shooting began at 11:40 but most of it started at noon. There were fewer hunters than last year, but there were enough ducks to go around. A great deal of shooting occurred throughout the whole marsh for about two hours. This barrage of firing gradually died down with the exception of the marsh area opposite Concession 11, West Gwillimbury Township. Here there are many potholes that attract ducks.

Steady firing continued in this area of the marsh that produced more ducks than any other one area. Hunters hearing continuous firing from this region were streaming in from other parts of the marsh to take part in the shooting. Quite a number of hunters left this area with their bag limit.

The hunters in general were satisfied with the day's hunt and were very co-operative in giving the department any necessary information. They gladly allowed the officers to collect wings.

Table 3, comparing the hunting success in Holland Marsh for 1959 and 1960 shows that the hunters had much better success in 1960 than in 1959. However, there were less than half the hunters checked in 1960 than there were in 1959.

In 1960 the officers checked 269 hunters who had shot 278 ducks, giving them a hunter's success of 1.03 while in 1959, 615 hunters had shot 338 ducks, for a hunter's success of .56.

The personnel who manned the access points were not all trained in the identification of ducks, let alone the aging and sexing. Before a completely accurate check of the ducks with respect to identity, age and sex can be made, the district will require some of their personnel to be trained in this field. For this reason a District collection of duck wings is being made.

Matchedash Bay

Waterfowl checking stations operating around Matchedash Bay on the opening day of the 1960 duck hunting season checked 162 hunters who had bagged 125 ducks for a hunter success of .77 ducks per hunter. Although a few more hunters were checked this year the kill is down somewhat from the 1959 season when 146 hunters shot 205 ducks for a hunter success of 1.4 ducks per hunter.

Eight stations were operated around the Bay on the opening day to inform hunters of the noon opening hour, check law infractions and to obtain data on hunters success. In addition to the eight stations manned by Department personnel from the Branches of Timber, Parks and Fish & Wildlife, two patrol boats of the Department plus one R.C.M.P. boat patrolled the Bay waters. Four Deputy Wardens were on duty during the opening day under directions of department personnel.

Shooting on the Bay opened in the northeast corner at 11:47 a.m. and by noon the thunder of the guns could be heard around the Bay. Shooting continued for about one hour and by 2:00 p.m. had mostly ceased. Only small flocks of ducks were seen flying at anytime. Shooting re-started around 6:30 p.m. and continued fairly heavy until closing time.

Severn River

The Severn River was patrolled by boat by two conservation officers from 4:30 a.m. to 5:30 p.m. on Saturday October 1. Twenty-five boats were checked prior to 12 noon and hunters were warned to observe the 12 o'clock opening hour. First firearm reports were heard

at 11:30 a.m. Only four flights of ducks were observed, these being teal and wood ducks.

TABLE I:

RESULTS OF OPENING DAY OF DUCK SEASON, OCTOBER 1, 1960 IN SOME AREAS OF LAKE SIMCOE DISTRICT.

	Holland Marsh	Vespra Little Lake	Little Mud Lake	Brock Twp.
No. of Hunters	269	35	52	75
No. Man-Hours	1609.5	135	290	342
No. of Dogs	11		1	
Mallards	49	10	10	13
Blacks	60	10	13	16
Pintail	21	5		
Green-winged Teal	66	3	12	9
Blue-winged Teal	29	4	16	13
Wood Duck	18	10	13	3
Ring-necked Duck	1	3		
Hooded Merganser	2	1		
Gadwall	2			
Baldpate	3	1		
Greater Scaup	2		2	
Ruddy Duck		1		
Canvasback		4		
Redhead		2	1	
Shoveler	4			
Lesser Scaup	1			
Unknown	20			
Cripples Lost	57			
No. ducks shot	278	29	68	54
No. ducks per man	1.03	.83	1.3	.72
No. Man-hours per duck	5.8	4.7	4.3	6.3
No. ducks per man-hour	.17	.21	.23	.16

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TABLE 2: Results of Opening Day of Duck Season, October 1, 1960, in Matchedash Bay.

Species	Male Adult	Male Juv.	Female Adult	Female Juv.	Total	% of Kill	Cripples Lost
Blacks	14	2	3	5	24	19.2%	1
Mallards	9	10	4	6	29	23.2%	7
Blue-winged Teal	5	1	3	4	13	10.4%	4
Green-winged Teal	5	3	3		11	8.9%	
Greater Scaup	1	2	1	4	8	6.4%	
Ring-necked Duck				3	3	2.4%	
Wood Duck	7	3	4	2	16	12.8%	2
Merganser Sp.	1	5	4	5	15	12.	
Pintail	1				1	.8%	
Common (American) Merganser				1	1	.8%	
Ruddy Duck				2	2	1.6%	
Canvasback				2	2	1.6%	
Unknown							2
TOTAL	43	26	22	34	125	100.01%	16

Summary

Number of ducks bagged	125.
Number of hunters checked	162.
Number of ducks per hunter	.77
Number of man-hours hunted	936.
Number of man-hours hunted per duck	7.5
Number of cripples lost	16.
Number of parties using dogs	14.

TABLE 3:

Comparing Hunting Success in Holland Marsh in 1959 and 1960.

	Per cent of Bag	
	1959	1960
Mallard	14.5	17.6
Black	21.0	21.6
Pintail	4.4	7.6
Green-winged Teal	25.7	23.7
Blue-winged Teal	12.4	10.4
Wood Duck	5.9	6.5
Baldpate (American Widgeon)	1.5	1.1
Hooded Merganser	1.8	.72
Unknown	10.4	7.2
Others	2.4	3.6

	Overall	Summary
No. Hunters checked	615	269
No. ducks shot	338	278
No. Ducks per man	.56	1.03
No. Man-hours per duck	9.2	5.8
No. ducks per man-hour	.11	.17
No. cripples lost	130	57

TABLE 4:

Comparing Hunting Success in Matchedash Bay in 1959 and 1960.

	Per cent of Bag 1959	1960
Mallard	30.2	23.2
Black	19.5	19.2
Pintail	.98	.8
Green-winged Teal	8.8	8.9
Blue-winged Teal	20.0	10.4
Wood Duck	5.9	12.8
Lesser Scaup	7.8	-
Hooded Merganser	3.9	12.0
Greater Scaup	-	6.4
Ring-necked Duck	.49	2.4
Others	2.4	4.0

	Overall	Summary
No. hunters checked	146	162
No. ducks shot	205	125
No. ducks per hunter	1.4	.77
No. man-hours per duck	2.9	7.5
No. ducks per man-hour	.34	.13
No. cripples lost	40	16

LUTHER MARSH GAME BAG CENSUS

October 1, 1960

by
A. T. Cringan

Abstract

A game bag census was conducted at Luther Marsh on opening day of the waterfowl season. Some 1,566 hunters were checked and they had bagged 931 ducks, 189 coots and three Canada Geese. The average hunter hunted 5.6 hours to bag 0.61 ducks and 0.12 coots. While the total kill of ducks was only 54% of the 1959 opening day kill, it was felt that this did not reflect the abundance of ducks at the marsh. Conditions for hunting were poor and many ducks took sanctuary in the Crown Game Preserve while others flew high well beyond the range of the gunners.

An estimated 1,875 hunters used Luther Marsh on the opening day of the waterfowl season in 1960. This estimate is based on a count of cars which were parked in the immediate vicinity of the marsh between 12.00 noon and 2.30 p.m. The mean number of hunters per car was obtained from five checking stations. One thousand eight hundred and seventy-five hunters is a minimum estimate, as some hunters arrived after 2.30 p.m. There were 658 cars present, and there was an average of 2.85 hunters per party.

Five checking stations were operated at major access points from 2.00 p.m. until most hunters had left the marsh, around 10.00 p.m. Some 1,566 hunters were checked, and they had hunted 8,803 hours to bag 931 ducks, 189 coots and 3 Canada Geese. The average hunter hunted for 5.6 hours and bagged 0.61 ducks as well as 0.12 coots.

Compared with opening day in 1959, number of hunters this year was down by about 100, or 5%, but hunters stayed longer, and so total hours hunted was up slightly. The total kill of ducks was only 54% of the 1959 opening day kill, and bag per hunter was 0.61 compared with 1.1 in 1959. Crippling losses, although not measured, likely were lower than in earlier years, owing to the gradual opening up of Luther Marsh over the years, which has made it easier to locate downed birds.

Information collected at the checking stations is presented in Table I. The sample of birds sexed and aged is considered to be too small to give an accurate age or sex ratio.

Table I. Species, Sex and Age of Waterfowl Checked at Luther Marsh, October 1, 1960.

Species	Adult ♂♂	Adult ♀♀	Juvenile ♂♂	Juvenile ♀♀	Sex, Age, not det.	Total	Per cent
Mallard	42	109	22	60	61	294	31.6
Black Duck	15	26	8	6	39	94	10.1
Gadwall	1	4		2	3	10	1.1
Pintail	3	2	3	8	6	22	2.4
Green-winged Teal	21	43	7	13	41	125	13.4
Blue-winged Teal	20	26	16	46	64	172	18.5
American Widgeon	3	9	8	9	24	53	5.7
Shoveler	1		1		4	6	0.7
Wood Duck	3	3	2	1		9	1.0
Redhead	2	1	2		4	9	1.0
Ring-necked Duck		2	2	2	5	11	1.2
Canvasback	1					1	0.1
Scaups (both spp.)	5	7	7	12	4	35	3.8
Bufflehead		1			1	2	0.2
Ruddy Duck	17	5	6	9	28	65	7.0
Mergansers		1		1	2	4	0.4
Unidentified ducks					19	19	2.0
Total Ducks						931	100.2
Canada Goose	2	1				3	
American Coot						189	

Discussion:

Even though the total kill of ducks at Luther Marsh on opening day, 1960, was only a little more than half as high as in 1959, this does not reflect the abundance of ducks at that marsh. Conditions for hunting were poor this year, as October 1st, 1960 was a fine, clear, warm, sunny day. Many ducks took sanctuary within the Crown Game Preserve at the north end of the marsh, while others flew high, well beyond the reach of gunners.

The proportions of Mallards, Blue-winged Teal and Green-winged Teal in the bag were normal, while Black Ducks, usually prominent, were much scarcer than usual. Among the less common species, record numbers of Ruddy Ducks, Lesser Scaup and American Widgeon or Baldpate were recorded. Despite year-to-year changes in abundance of species, Mallard, Black Duck and the two teals remained as the four most important species at Luther Marsh on opening day.

SUMMARY OF FALL, SPRING AND SUMMER GOOSE AND DUCK KILLS, IN PATRICIA EAST, 1960

by
A. Gagnon

Abstract

Statistics are presented on the kill of geese and ducks by hunters and Indian families in the James Bay area of Patricia East during 1960. Data were collected by Lands and Forests personnel from two checking stations, licensed hunting camps and from Indian families in the area. A total of 1649 hunters killed 18,200 geese and ducks. Waterfowl killed by Indian families during the fall of 1959 and spring of 1960 was 28,990. The number of kills for the past four years are compared.

Statistics were taken from the check stations at the mouth of the Moose River, Len Hughes' Camp, Fort Albany, Bill Anderson, Fort Albany, James Bay Goose Club at North Bluff, 22 miles along the west coast from Moosonee and Ontario Northland Goose Camp, Hannah Bay, approximately 50 miles east of Moosonee along the east coast. Data were also collected from the Indian families for their fall, spring and summer kills in Patricia East portion.

This year's data were collected as in the past three years, such as; the hunter's name, address, license number, species and number of kills.

Patrol activities and collection of data from the hunters and Indian families at the two check stations were carried out by Lands and Forests personnel. Statistics from the licensed hunting camps were collected by the R.C.M.P. personnel.

Peter Kataquapit, Ranger and the writer collected data from all the Indian families from Lake River, Attawapiskat, Fort Albany, Moose Factory and Moosonee areas for the fall, spring and summer kills. Data from each individual Indian were sent to Maple and the District Office with the annual report. A summary of the kills is included in this report.

Sanctuary Established in January 1958

The Moose River Bird Sanctuary at the mouth of the Moose River which consists of two locations; one part being on Shipsand Island on the west shore and one on the east shore from the mouth of Moose River to Partridge Creek. Both parts consist of approximately 3600 acres. The establishment of the sanctuary was to improve the hunting for the Moose Band Indians.

Number of Kills for the Past Four Years from the Moose River Checking Stations and Licensed Camps.

			Fall	Blue-Snow Geese	Canada Geese	Ducks
Check Stations						
Number of Hunters	-	809	1957	3504	124	1567
American Hunters	7%	944	1958	7821	166	1329
American Hunters	8%	1034	1959	11557	204	1482
American Hunters	4.6%	1336	1960	11745	296	1824
O.N.R. Hannah Bay						
Number of Hunters	-	131	1957	1136	31	568
American Hunters	90%	95	1958	1185	10	228
American Hunters	78%	101	1959	924	20	219
American Hunters	81%	145	1960	1663	19	297
James Bay Goose Club						
Number of Hunters	-	85	1957	562	10	113
American Hunters	40%	63	1958	797	10	122
American Hunters	40%	68	1959	735	13	166
American Hunters	63%	32	1960	288	11	23
Len Hughes, Fort Albany						
Number of Hunters	-	107	1957	1038	36	72
American Hunters	80%	97	1958	1142	11	81
American Hunters	81%	101	1959	1039	17	219
American Hunters	78%	103	1960	1286	56	314
B. Anderson, Fort Albany						
Number of Hunters	-	-	-	-	-	-
American Hunters	33%	53	1958	370	8	18
American Hunters	51%	41	1959	459	11	68
American Hunters	3%	33	1960	344	5	29

1960 DATA FROM MOOSE RIVER CHECKING STATIONS FROM SEPT. 15, to NOV. 5

	Killed by Licensed Hunters		Killed by Treaty Indians	Totals
Blue Geese				
Adults	2142		3478	5620
Juveniles	1755		2237	3992
			Geese Salted	465
			Geese Smoked	98
		(*)	10% Added	961
				11136

Killed by Licensed Hunters		Killed by Treaty Indians	Totals
Snow Geese			
Adults	201	221	422
Juveniles	52	80	132
		(*) 10% Added	55
			609
Canada Geese	188	108	296
		(*) 10% Added	30
			326
Ducks	924	734	1658
		(*) 10% Added	166
			1824

(*) For the birds not accounted for such as eaten in the field, wounded birds that were lost, poaching and Quebec Indians killing birds in Ontario 10% of the kill was added as a conservative estimate.

Total Goose Kill from the Checking Stations and Licensed Camps.

Blue and Snow Geese	15326
Canada Geese	387
Ducks	2487

Number of Canadian Hunters ----------	765
Number of American Hunters ----------	284
Number of Treaty Indians ----------	571
	1620

Number of Hunters with no kills ---------- 164

Weather

Comparing weather conditions for the past four years for goose hunting is as follows: Seasons - 1957 fair
1958 good
1959 good
1960 good

Patrols

Goose patrols were carried out extensively by the Dept. of Lands and Forests staff this fall as the R.C.M.P. did not have the help and equipment required as in previous years.

Convictions

There were no charges laid this fall. A few minor infractions were settled in the field. As a whole the hunting regulations were observed by the outside hunters and local people to a degree that satisfied the enforcement staff in the field.

Recommendation

Due to extreme variation among personnel working at the Check Stations and on Patrols, an attempt to provide more consistent results may possibly be reached by using local employees who have a knowledge of the James Bay coast, the surrounding area and the local guides. This would help to provide more accurate results.

INDIAN FAMILIES IN PATRICIA EAST PORTION-KILLS FOR FALL, SPRING AND SUMMER

SUMMER AND FALL OF 1959 SPRING OF 1960

	Canada Geese			Blue Snow Geese			Ducks		
	Sum.	Fall	Spr.	Sum.	Fall	Spr.	Sum.	Fall	Spr.
Moosonee		35	1480		765	1008		89	678
Fort Albany		456	2287		5041	1334	113	987	611
Attawapiskat	178	493	2534		6380	2072	473	1608	368
	178	984	6301		12186	4414	586	2684	1657

CHECKING STATIONS, LICENSED CAMPS AND INDIAN KILLS IN PATRICIA EAST PORTION

	1960	1959	1958	1957
Canada Geese	7850	9097	6685	4124
Blue - Snow Geese	33926	31158	30844	22736
Ducks	7414	8067	7963	6229
Total Birds Killed	49190	48322	45492	33089

PHEASANT HARVEST 1960 - LAKE SIMCOE DISTRICT

by
J. S. Dorland

Abstract

During the 1960 open season for pheasants in the 16 Regulated Townships of Lake Simcoe District some 1,842 hunters were checked. This sample survey showed that 881 pheasants had been harvested in 6,438 man-hours of hunting for an average of .48 birds per hunter. It required 7.3 man-hours of hunting to bag one bird. A total of 7,650 township licences had been sold up to Oct. 29; 3,160 to residents and 4,490 to non-residents, an increase of some 900 township licences over the previous year.

A mixture of sun, rain and overcast greeted the majority of pheasant hunters during the open season this year in the Lake Simcoe District. This changeable weather, however, did not deter the pheasant hunter who was out in force during the two to three weeks open season. From October 19 to 29 the hunters in the regulated townships of Ontario and York Counties and from October 12 to 29 in Peel County enjoyed a fair amount of good hunting. Although the hunter success picture this year varies little from the previous years, hunters with dogs had good luck in those townships participating in the banded pheasant release project where a good number of adult birds were released just prior to the open season.

A total of 15,400 day-old poults and adult pheasants were received from the Provincial Hatchery at Codrington. Seven thousand of the above number were day-olds which were raised by the participating townships to poult age and released. The remainder, less some 900, were immediately released as poults and adults. The 900 poults were raised to adult age and released just prior to the open seasons. See table # III for Pheasant Distribution.

A total of 7,650 township licences were sold up to the 29th of October, 3,160 to residents and 4,490 to non-residents of the townships. This is an increase of some 900 township licences over the previous year. The bulk of this increase is made up of resident licences sold by the township of King. See table # II for further information on township licences sold.

If it may be supposed that all hunters purchasing township licences hunted during the open season in those townships showing a pheasant harvest, the approximate kill of pheasants in these townships would be 3,300.

Hunter Statistics for 11 Regulated Townships

Number of regulated townships	16
" " " " showing pheasant harvest	11
Number of hunting parties checked	705
" " " " using dogs	343
" " hunters checked	1842
" " man-hours hunted	6438
Cock birds seen	1261
Hen birds seen	1028
Cock birds harvested	546
Hen " "	335
Total " "	881
Bird per hunter across district	.48
Man-hours hunted per bird	7.3

See Table I for complete summary.

Figures tendered by the Barrie and District Sportsmen's Association regarding pheasant hunting in those townships bordering Barrie, show hunter success as follows:

No. Days Recorded	No. of Parties	No. of Hunters	Man-Hrs. Hunted	Cocks Seen	Hens Seen	Cocks Killed
5	15	48	192	26	40	13

Hens Killed	Total Killed	Bird per Hunter	Man-Hrs. per Bird
17	30	.60	6.6

Remarks

As the district was participating in a regional banding project with the pheasants this year, the bulk of our data were recorded from the townships involved in this project. Thus, some of our regulated areas were not covered to the extent they have been in previous years. Although Vaughan Township shows the best results (Table III), it is not a true picture owing to the small number of hunters that were checked.

The majority of the hunters picked the townships of Markham, Whitchurch and Toronto to do their hunting, where results were about one-half bird per hunter in Markham and Chingaucousy but, fell well down from previous years in Whitchurch where hunters had only fair success.

Nil reports on pheasant harvest were recorded in the three South Simcoe townships, East Gwillimbury in York and Toronto Gore in Peel. These townships outside Toronto Gore are in very marginal pheasant lands and the hunters checked there during the open season were content with the hunting of rabbits.

Although the hunter enjoyed a lengthy season plus introduced adult pheasants just prior to the open season in five townships, the hunter success remained relatively the same from the previous year.

TABLE I: PHEASANT HARVEST REPORT 1960

LAKE SIMCOE DISTRICT

	Days Open	No. Days Checked	Parties Checked	Parties Using Dogs	No. Hunters Checked	Man-Hours Hunted
Whitby	10	6	38	23	99	360
E. Whitby	10	3	6	2	11	20
Pickering	10	8	69	31	206	872
Markham	10	6	150	75	441	1629
Whitchurch	10	7	157	81	388	1294
Vaughan	10	4	6	1	13	56
King	10	5	37	17	94	295
Albion	16	2	5	2	16	48
Caledon	16	6	26	12	51	178
Chingaucousy	16	10	59	28	152	546
Toronto	16	9	152	71	371	1120
Totals			705	343	1842	6438

TABLE I, CONT'D:

	Pheasants Seen M	Pheasants Seen F	Pheasants Shot M	Pheasants Shot F	Total Shot	Bird Per Hunter	Man-Hr. Per Bird
Whitby	76	41	39	16	55	.54	6.6
E. Whitby	2	8	5	1	6	.54	3.2
Pickering	94	88	83	42	125	.62	7.0
Markham	437	404	135	101	236	.51	6.9
Whitchurch	129	141	63	41	104	.27	12.4
Vaughan	18	14	9	5	14	1.0	4.0
King	118	112	49	24	73	.79	4.0
Albion		2					
Caledon	14	13	6	8	14	.27	12.7
Chingaucousy	74	42	70	17	87	.57	6.3
Toronto	199	163	87	80	167	.45	6.6
Totals	1261	1028	546	335	881	.48	7.3

TABLE II:

Township Licences Sold up to October 29, 1960.

Township	Resident	Non-Resident	Total
Whitby	399	240	639
East Whitby	79	134	213
Pickering	379	400	779
Markham	355	666	1021
Vaughan	238	226	464
King	285	739	1024
Whitchurch	191	487	678
East Gwillimbury	145	91	236
Albion	82	400	482
Caledon	83	140	223
Chingaucousy	200	190	390
Toronto Gore	25	100	125
Toronto	520	150	670
Adjala	20	110	130
Tecumseth	79	302	381
West Gwillimbury	80	115	195
Totals	3160	4490	7650

TABLE III:

PHEASANT DISTRIBUTION
LAKE SIMCOE DISTRICT 1960

Township	Day-Old	Poult	Adult	Total
Whitby	700	700	30	1430
East Whitby	500	500	30	1030
Pickering	1200	1300	30	2530
Markham	700	700	30	1430
Whitchurch	800	800	30	1630
Vaughan	800	800	30	1630
King	500	900	30	1430
Peel County	1300	1600	50	2950
Adjala		150	10	160
Tecumseth		200	10	210
West Gwillimbury		200	10	210
East Gwillimbury		150	10	160
Miscellaneous	500	100		600
	7000	8100	300	15400

PELEE ISLAND JULY SURVEY (AND ESSEX COUNTY) 1960

by
L. J. Stock

Abstract

The Annual Pheasant Survey on Pelee Island indicated an increase in the number of broods present of 19.9%. Using this increase as an index the population for the hunt was estimated at 8,900 cocks and 13,300 hens. The suggested bag limit at the end of the survey was 10 cocks and no hens. Also included are additional population data; the results of pheasant faecal examinations for parasites and disease by Dr. J. K. McGregor, Ontario Veterinary College; a list of plant specimens collected harbouring insects or disease; notes on fire, weather, and cover.

Method

The annual Pelee Island Survey is essentially a roadside brood count, from a vehicle, over fixed road transects, to obtain an index to the population. The same conditions apply to the mainland survey in Essex County.

THE ANNUAL PELEE ISLAND PHEASANT SURVEY WAS CARRIED OUT FROM JULY 11-27, 1960.

The results of the survey indicate a pre-shoot pheasant population of -

Cocks	8,900
Hens	13,300
Total	22,200

Bag limit set - 10 cocks, no hens

Population data for 1958, 1959, 1960 are tabulated below.

FINAL PHEASANT POPULATION DATA IN JULY, 1960
Compared to 1959

	1958	1959	1960	1959-1960 DIFFERENCE No.	1959-1960 DIFFERENCE %
Total Broods Counted	482	236	283	+ 47	+ 19.9%
Total Cocks	62	39	34	- 5	- 12.8%
Total Hens	620	409	403	- 6	- 1.5%
Broodless Hens Count	139	177	115	- 62	- 35.0%
%	22.4	43.2	28.5		
Broods per mile (138 mi.)	3.5	1.7	2.0	+ 0.3	
C/H ratio	1/10	1/10.5	1/11.8		
Brood Size	7.5	7.1	6.5		

MAINLAND ONTARIO

ESSEX COUNTY - POPULATION DATA

	1957	1959
Total Broods	23	34
Total Cocks		29
Total Hens		46
Broodless Hens No.		12
%		27
Broods per mi.	0.23 (102 mi.)	0.27 (124 mi.)
C/H ratio	1/1.5 (Estimated)	1/1.58
Brood size		7.8
Bag Limit	3 birds per day, one of which may be a hen.	

PELEE ISLAND

Fires observed from July 12 - 27, 1960.

Only two small grass fires had occurred prior to July 12th and no others noted during the survey period.

These fires were obvious attempts to clean up a mowed roadside and were not successful. There was no damage to property and no pheasant nests were found in the burned areas.

The above is in marked contrast to conditions in July, 1959, when 13 fires were recorded, one of which threatened the destruction of buildings. Almost all of these were deliberately set. The total burned area was estimated at 6.77 acres in which were found 84 pheasant nests and 843 eggs.

The destruction of wildlife along with extensive destruction of cover by mowing and spraying was pointed out to the Pelee Council by letter (now on file) in 1959 and it is now gratifying to see conditions improved.

A comparison of the two years illustrates that almost all such fires can be avoided if people will stop and think and take proper precautions.

Crop Conditions

Seeding was late, particularily of soy beans, some of which had only emerged when the survey began. The spring was cool and wet and corn is still (at July 27th) showing the effect of the excessive moisture - bottom leaves are necrotic. Some farmers state that cultivated crops are the poorest in many years.

Wild plants are particularily luxuriant and cover is dense.

Weather

The winter of 1959-60 was normal. There were no ice conditions as in the previous winter, no excessive snow or unseasonable temperature.

The spring, as in the remainder of the District, was wet and cold with at least two periods of almost a week each wet and cold, with very little sun. The number of broods hatching in May decreased rather than increased during the last two weeks.

In two rainy periods - June 11th to 14th inclusive and July 1st to 2nd inclusive, the total rainfall recorded was 2.02 and 2.26, respectively. There is no doubt that some young pheasant chicks died and that clutches of eggs were washed away or abandoned. Loss of nests is well illustrated by an interruption in the hatching curve following the rainy periods.

On the mainland, following the heavy June rains, 4 - 5 week old poults were found dead in raising pens - definite evidence that mortality did occur.

Following is the recorded total monthly rainfall for Pelee Island for four years:

RAINFALL RECORDS PELEE ISLAND

	April	May	June	July
1957	2.39	2.36	3.70	
1958	2.92	1.71	3.73	
1959	4.69	5.05	1.29	
1960	3.06	3.68	2.95	2.26 (July 1 & 2 only)

In spite of the much higher rainfall during April and May in 1959, there was no apparent interruption to the hatch similar to that in 1960. This is due in part to the intensity of the rain over a short period in 1960 and in part to the late hatch in 1959, the peak of which occurred during the week of July 1st following the driest June on record.

Cover Destruction

There was some roadside mowing and spraying before July 12th and mowing continued throughout the survey but on a much reduced scale than in July, 1959. Notes on the grass fires observed in 1960 are included elsewhere in this report.

Study of Diseases & Parasites of Pheasants

A routine collection of pheasant faecal samples was collected and mailed to Dr. McGregor at Ontario Veterinary College for examination. The attitude of the present council has not changed from last year regarding this subject and they are apparently sending no birds to Dr. McGregor.

DISEASES AND INSECTS OF PLANTS OBSERVED ON PELEE AND ADJACENT ISLAND, JULY 1960

by
J. K. McGregor, Department of Parasitology,
Ontario Veterinary College, GUELPH, Ontario.

Following are some observations of plant diseases and insects, found mainly on trees, on Pelee and adjacent Islands in Western Lake Erie and in the vicinity of Sandusky, Ohio, from July 12 to 27, 1960.

Samples of almost all species marked * were sent to the Forestry Pathology Laboratories either at Maple or Sault Ste. Marie. Others were pressed and preserved in the dry state for identification.

Elm Mortality

The number of dead and dying elms has increased greatly from last year. The cause is probably Dutch elm disease as its presence here has been confirmed from samples.

Dead elms are also conspicuous on the Islands of Old Hen, East Sister, Middle and on all Islands from Pelee to Sandusky, Ohio, and in the vicinity of Sandusky. Trees of all sizes are affected.

Sycamore *

"Tip die-back" of Sycamore is present on Pelee and around Sandusky. Leaf drop in some cases is severe and the soil beneath the tree is almost leaf covered. All dead leaves observed are a characteristic dark brown. No tree was seen unaffected of approximately 100 encountered. The Sycamore has been extensively used for landscaping in and around Sandusky.

Red Ash

Leaf spot on seedlings *
Leaf "mosaic?" on mature trees *

Oak sp.

Leaf spot *
Severe leaf damage by possibly a virus or fungus *
Entire mature trees are affected by the latter. One mature tree is dead. There are several species of oak on the Island.

Hackberry

Leaf mosaic? possibly a virus *
Leaf gall - abundant *

Maple

No typical anthracnose pattern was seen on leaves. However some trees were partially defoliated previously and the trees are now in leaf, but the entire tree or section of it appears to wilt although the weather has not been excessively hot and abundant moisture was certainly not lacking this year. There is some apparent insect damage on maples *.

Fragrant Sumac

Tip die-back is common and grossly resembles the pattern on the sycamore. It may be caused by a disease or an insect.* This is an important shrub here - providing a great deal of natural cover for pheasants.

Walnut

There is an insect leaf eating larvae on walnut - not serious at present. *

Buttonbush

Leaf Curl* - not serious

Black Elder

Larvae (caterpillars) in web* - not serious

Dogwood sp. (not Florida)

Scale on stems* heavy infestation in some areas.

Hawthorn

Fungus on fruit complete infestation on some mature trees - fruit destroyed - common.

Giant Ragweed

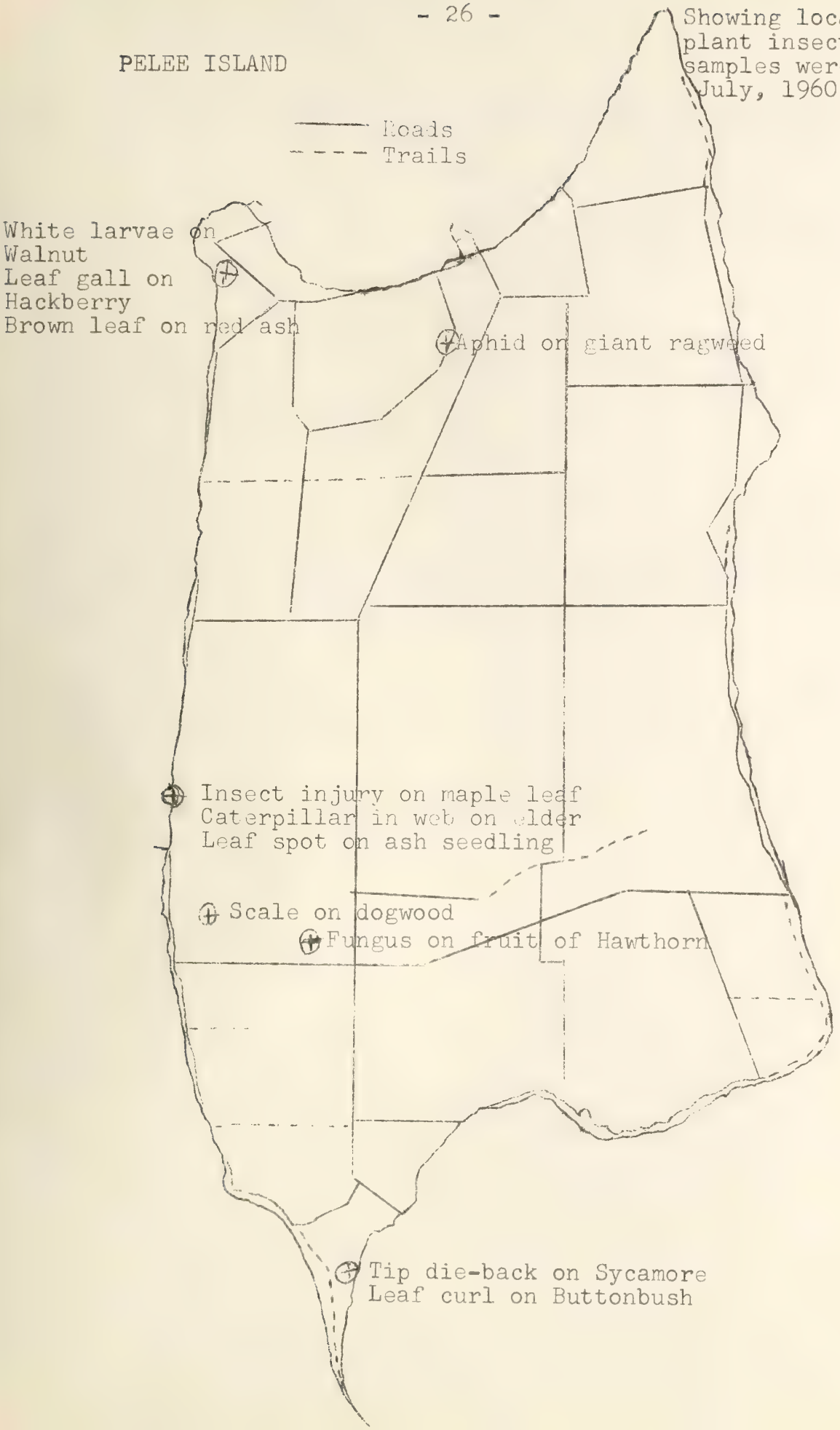
Black aphids and larvae of Lady bird beetle.*
Heavy infestation in local areas

The attached map shows the approximate location where the samples were collected. In the majority of cases the insects and diseases also occur elsewhere on the Island.

A large soft brown scale found on Hackberry in previous years was not found this year.

PELEE ISLAND

Showing locations where plant insect and disease samples were collected, July, 1960



Enclosed herewith is a copy of the results obtained in an examination of the faecal specimens submitted from Pelee Island.

#1	--	#14	--
#3	Coccidia	#20	Coccidia, capillaria
#5	--	#20(a)	--
#7	--	#25	--
#7(a)	--	#25(a)	Coccidia, capillaria
#8	Spirurid larvae 3	#27	--
#11	--	#28	--
Old Hen Island		No No.	Syngamus

We assume that this is just an annual check of the parasitic situation on Pelee, however if there is any disease apparent I expect that you will be in touch with us.

THE PELEE ISLAND PHEASANT SHOOT 1960
STATISTICS AND DISCUSSION

by
L. J. Stock

Abstract

One thousand and twenty hunters bagged 5794 cocks - an average of 5.68 per hunter during the two day season. The post season population estimate is 2584 cocks and 10,746 hens. The indicated survival of 490 cocks released in March 1960 was 24%. The summer adult cock population is estimated from observations of banded birds in the field during July. Crippling loss is estimated from hunter reports. Comments on the shoot submitted in writing by the hunters indicated that the shoot was not as popular as in previous years. Statistics of the shoot and discussions are presented.

Statistics Based on Hunter Questionnaires

Season - Oct. 26 and 27th
Bag Limit - 10 cocks, no hens

Total Number of Hunters		1020
Number of Returns Received		184
Sample Size		18%
Total Cocks Bagged		5794
Hunter Success		
Cocks bagged per hunter		
1st day	4.6	
2nd day	1.08	
Total		5.68
Cocks bagged per hunter hour		
1st day	0.62	
2nd day	0.24	
Total		0.48
Hunters who bagged limit (both days)		13%
Hunters who bagged no birds		2.2%
Hunted 1st day only		5.5%
Hunted both days		94.5%

Hours per hunter in the field		
1st day	7.4	
2nd day	4.6	
Total		12.0
Hours hunting to bag a bird		
1st day	1.61	
2nd day	4.26	
Average both days		2.1

Crippling Loss

Computed totals

Cocks 27.7% of the bag (Hit and not retrieved)	1605	
Less cripples picked up by another and included in the bag.		
2.8% of the bag (10% of cripples)	162	
Net loss 24.9% of bag		1443
Picked up, shot by another		
5% of bag	290	
Included in the bag		
2.8% of bag	162	
Unaccounted for 2.2% of bag		128
Seen and not picked up		
2.8% of bag		162
Total dead cocks seen by hunters (This is 28% of cripples hit or 7.9% of the total bag)		452

Hens

By sample hunters		
Picked up, shot by another	67	
Seenand not picked up	408	
Total found dead		475
This is equivalent to 45.5% of the cocks bagged or 2636 birds.		

Computed totals

Seen and picked up		
Per Hunter	0.36	
Total		370
Seen and not picked up		
Per Hunter	2.22	
Total		2264

Total seen dead
Per Hunter 2.6
Total 2636

Crippling Loss Data Compared for 1958, 1959, 1960.
All Hunters both days
Cocks and Hens.

	1958		1959		1960	
	No. of Birds	% of Bag	No. of Birds	% of Bag	No. of Birds	% of Bag
Hit and not retrieved	2580	23	2003	24	1605	27.7
Seen dead in field	2878	25	2638	22	3086	53.0
Seen dead and not picked up	1553	14	1607	19	2426	42.
Seen dead and picked up	1325	12	1031	12	660	11.4
Picked up and included in the bag			442	5.3	162	2.8
Total bag	11227		8350		5794	
Bag Limit	9C 2H		8C 2H		10C OH	

Crippling Loss

Hit and not retrieved Cocks 1605
Percentage of bag 27.7
Per hunter 1.57
Picked up shot by another Cocks 290
Percentage of bag 5
Picked up shot by another Hens 374
Percentage of bag 6.45
Included in the bag Cocks 162
Percentage of bag 2.8
Included in the bag Hens 0
Seen dead and not picked up Cocks 162
Percentage of bag 2.8
Seen dead and not picked up Hens 2264
Percentage of Bag 39.
Total hens dead 2636
Percentage of bag 45.5
Hens found dead per hunter 2.6
Hens handed in (all hunters) 39.

Unaccounted for Hens	2597		
Cocks	128		
Total			2725
Percentage of bag	48%		

Population Data

Cocks

Pre-season estimate, July, 1960			8,921
Less 10% of bag for loss and illegal kill	743		
Less stock estimated	750		1,493
Net birds to bag (native) 1960	7428		
Birds bagged 1960	5794		
Difference (21.8% of estimate)			-1,634
Kill Estimate			
Bag	5794		
Plus net crippling loss	1443		
Total Kill			6,837
Pre-season population			
Native birds, July estimate		8921	
Plus imports		500	
Total			9,421
Post season population			
Pre-season population		9421	
Less total kill		6837	
Net			2,584

Hens

Pre-season population July estimate			13,382
Post season population			
Pre-season July estimate		13,382	
Less total seen dead		2,636	
Net			10,746

Band Returns

Banded Cocks released in March 1960	490
Banded birds reported shot by sample hunters	17
Contribution 1.6% of total bag	93

Percentage of total kill	1.36%
Percentage of pre-season population estimate	0.98%
Indicated survival	117
Percentage survival	24%
Remaining in the population	25 birds

For Comparison - March release

1952 released	192	survival 15%
1956 released	300	survival 17.7%

Banded and Unbanded Cocks
Observed in the field July 1960.

In March 1960, 490 banded cocks were released on the Island, and it was decided to attempt to get some information on the prevalence of these birds during the summer. Consequently during the annual brood count, July 12 to 27 inclusive, all cock birds observed, were checked to ascertain, if possible, whether or not they carried bands. If it was established that they did or did not carry bands they were recorded as banded or unbanded. The results were as follows:

Banded cocks observed	16	-	38%
Unbanded cocks observed	26	-	62%
Total	42		

Ratio of banded to unbanded 1 : 1.63

The average yearly mortality rate (from shoot to shoot) for native cocks, as established by Stokes is 30%. It is estimated that the mortality up to July is 20%. These estimates have been used in the work on Pelee for a number of years, and are much less than the mortality of released birds as shown in this report.

The following statistics from the shoot involving a known number of banded birds are given in an attempt to check the estimates of the adult cock population in July and at the shoot.

Banded cocks surviving to the shoot (March to October)	117	-	24%
Mortality (March to October)			76%

The mortality rate would probably be greater immediately following release and is estimated at 50% up to July. Therefore, the number of banded cocks alive would be 50% of 490 or 245.

Assuming that the ratio banded to unbanded cocks observed, is representative of the population, the 245 surviving banded birds represents 38% of the adult cock population. The native cock population in July would then be 400, and the total number of cocks would be 645.

The estimate of cocks alive after the shoot in 1959 was estimated at approximately 750. Mortality is estimated at 20% from

the shoot until the next July which would leave 600 native birds. This compares with the 400 estimated from banded birds seen in the field in July. This is a small sample and estimates are tentative.

The assumption that the banded to unbanded cock ratio is representative of the population may not be true, because imported cocks may be without established territories and may tend to wander where they are more easily observed.

There may also be errors in the post shoot estimate, or the mortality rate could have been above average, which would account for the lower number of cocks calculated from the observation in July.

Hunters Comments on the Shoot

Total returns without comment	87	-	47%
Total returns with comment	97	-	53%
	184		
Favourable re the hunt	5	-	5.4%
Adverse re the hunt	92	-	94.6%
	97		

Adverse comments represent 94.6% of those who commented or 50.0% of those who submitted returns.

Hunters who complained of an outright scarcity of birds or a scarcity in proportion to the number of hunters, or a scarcity of shooting opportunities due to adverse weather and wet cover. - 69 - 75%
(of those offering comments)

Number of hunters checked or interviewed by Conservation Officers during both days 31%

For comparison, some statistics from the 1957 shoot are of interest.

Number of hunters	1000
Bag Limit 9 cocks 0 hens	
Number of hunters who shot their limit	48.6%
Average bag	7.4%
Total bag	7400
Loss and illegal kill (10% estimated)	740
Total kill	8140
Pre shoot population estimated (Kelker Index)	8897
Number of birds after the hunt	757

The estimates of the pre-shoot population and the bag are practically the same as in 1960. The total kill in 1960 is down 1203 birds or 14.7%.

Discussions:

General

For the first time in six years the weather for the shoot was poor. Rain on the first day resulted in wet cover, wet birds, and wet hunters. The birds preferred to run rather than fly and many hunters were apparently dissatisfied with the shoot and said so emphatically. (See comments on the shoot by hunters). There was a noticeable increase in the prices charged for board and lodging which added to the general dissatisfaction. It was unfortunate, from the residents standpoint that this increased expense to hunters occurred in a year when the shoot was subject to more than average criticism.

A number of hunters mentioned the increased competition for Pelee Island, from shooting preserves, and stated that they would not return to Pelee.

Hunter Success

According to the statistics obtained from the hunter questionnaires, the shoot was not nearly as poor as one would expect from the general comments.

The number of hunters decreased by 117 due largely to the decline in the reported number (100) of resident hunters. In 1959 there were 200 resident and complimentary licences sold.

The number of cocks bagged per hunter was slightly higher in 1960 (0.12 per hunter). The total bag was down by 546 birds and when imported birds are considered (1000 in 1959, 500 in 1960) which were released a few days prior to the hunt, the bag of native cocks was practically the same in both years.

There are, however, other reasons for the discontent of the hunters. The cock bag was increased from 8 to 10 and the hen bag was reduced from 2 to 0. The higher bag of cocks is more difficult to attain even under ideal conditions and this difficulty is increased by adverse weather.

Shooting of Hens

During the 1959 hunt the overall bag was increased by the inclusion of two hens, and over 90% of the hunters shot their quota. Hens were excluded in 1960 and reports of the hunters indicate that 2636 were seen dead in the field and 2264 were not picked up. These figures represent 45.5% and 39% respectively of the cocks bagged and exceed the number of hens bagged (2028) in 1959. The hens bagged in 1959 brought the total average bag to 7.4 birds and was a major factor in making the hunt a success.

The psychological effect on the hunter "bagging his limit", particularly on Pelee Island is also a yardstick by which the success of the shoot may be measured. The hunts of 1956 and 1957 were considered a success by popular opinion. In 1956, with the limit at

only 6 cocks 89% of the hunters bagged their limit, and in 1957 with the limit of 9 cocks 48.6% bagged their quota; while in 1960 with the limit set at 10 cocks, only 13% bagged their quota.

By coincidence, the average bag of cocks 5.68 in 1956 was exactly the same as in 1960.

It would seem that the ability of the hunter to attain his limit is more important than the number of birds bagged.

Shortage of Birds.

The pre-season cock population, as estimated in July was 8921. After allowing for crippling loss, illegal kill and stock, the net birds available to the hunters were estimated at 7428.

To make the shoot a success, the Pelee Council has set as their objective, a minimum bag for this and future years of 10 birds. This would require a minimum of 10,000 birds available to the hunter. Our estimate this year (1960) of 7,400 approximately was 2600 or 26% short of the minimum requirements, thus a shortage of birds was inevitable.

To have 10,000 birds for the hunters the pre-season population must be in the order of 12,000 to allow for crippling loss, illegal kill and residual cocks for breeding.

It was quite evident, at the end of the annual survey in late July, that the Pelee Council were convinced that the survey estimate was low and that there was a sufficient number of cocks to warrant a bag limit of 10 and so recommended. They agreed to buy and release birds if, in their opinion, the population seemed to decline. This decline apparently did not occur, and they were optimistic even shortly before the shoot, although they did import and release 500 cocks a few days prior to opening day. According to our estimate they should have released for the hunters an additional 1000 to bring the available population up to minimum requirements for the shoot and 2000 more to allow for loss and stock.

The number of birds actually bagged was lower by 1634 (21.8%) than the estimated number available, and was little more than half (58%) of what it should have been for a bag limit of 10.

Factors contributing to this shortage could have been a high estimate, poor hunting weather, above average mortality from July to the shoot, above average illegal shooting, or a combination of all these factors.

Post Season Estimates

During the past few years, the weather and hunting pressure have been quite constant and the number of cocks remaining after the shoot, estimated at between 700 and 800, seemed reasonably accurate.

In 1960, with poor weather, and somewhat less hunting pressure, the post season estimate of 2584 cocks is quite possible.

The estimated population of hens made in July less the total seen dead, leaves 10,746 alive after the shoot.

In spite of the optimism of the Pelee Council prior to the shoot when birds were declared abundant, and the smaller than expected total bag, the post season population is declared, by the Council, to be dangerously low. The shortage of birds is believed serious enough to warrant restocking which has been done. One thousand hens and 500 cocks were imported from Wisconsin early in December 1960 and released.

There is no procedure by which the population can be measured until next July, so we will have to "wait and see", whether or not the situation is critical.

We have no evidence that an epidemic reduced the population between July and October. However, the shipment of birds to Dr. K. McGregor at O.V.C., for examination, has at best, been spasmodic and disease might have occurred without detection. We know that pathogens do exist in the populations and may at any time build up when conditions become favourable.

If the post season estimate of hens, 10,746 is reduced in the same ratio as the estimated cock bag (21.8%), the revised post season hen population is 8404. Even if the post season estimate is reduced by 50%, which is unlikely, the hen population should still be in excess of 5000. The impression conveyed by the Pelee Council, by telephone, indicates that the residual population is much less than this. If this is true then there has been a major die-off of birds of which we have no evidence or reports.

Supervision of the Shoot

Three Departmental Officers supervised the shoot. Ken Juck and Bruce Howell were there for the entire week, with Vic Walker assisting during the two days open season.

Thirty-one percent of the hunters were contacted by the officers during the hunt.

Twelve violations of the hunting regulations were found and appropriate charges laid, nine for late shooting one for early shooting, and two for using a shotgun with the magazine unplugged.

Acknowledgements

The work of Assistant Senior Conservation Officer Ken Juck, Conservation Officer Bruce Howell, and Vic Walker, who supervised the shoot and collected the data which made possible this report, is gratefully acknowledged.

UTILIZATION BY MOOSE IN WINTER OF TWENTY-FIVE SQUARE MILES OF PULPWOOD CUTOVER, GERALDTON DISTRICT, 1959-1960.

by
J. A. Macfie

Abstract

Repeated censusing of a 25 square mile tract of cutover land near Geraldton between Dec. 7, 1959 and April 1, 1960, lent support to the belief that while moose favour such open range during the first half of the winter, they tend to move to heavier cover in February and March. Attempts were made to measure the degree of utilization of the various timber types as winter progressed. Of a variety of classes of cutover, moose appeared to prefer the most lightly disturbed stands. A high proportion of the moose seen during the winter were calves, and a possible shortage of bulls was noted. Movements of certain individual animals were traced for periods of up to sixteen weeks.

Introduction

A standard 25 square mile aerial moose census plot situated 15 miles south of the town of Geraldton was censused 18 times at regular intervals between December 7, 1959 and April 1, 1960. Observations of moose were plotted on large scale timber type maps*, thus a record of moose distribution on that particular section of range through most of the winter was obtained, permitting assessment of the different timber types in terms of their attractiveness to moose. In addition, some information on the movements of individual animals was recorded.

Plot Description

Map No. I is a timber type map of the plot, Table II summarizes the distribution of timber types within the plot, and Table III describes in detail the composition of certain types.

The project had two purposes; it was designed to test the efficiency of aerial censusing under various conditions (see "An Analysis of Some Factors Affecting Aerial Moose Censusing" by J. A. Macfie) as well as for range study, but in setting up the plot the objectives of the latter were given the most consideration. The general area in which the plot is situated has been extensively logged over for pulpwood during the past 15 years by the Kimberly-Clark Corporation, which presumably has improved it as moose range. The

*Two Large scale Maps accompanied the original report which is on file in the Fish and Wildlife Library, Maple.

plot was placed so that the company's Goldfield Road, an all-weather trunk system which moose hunters are permitted to use freely, bisected it. Other considerations were nearness to the Geraldton air base, and accessibility for ground work.

The surface of the study area may be described in general terms as gently rolling, although there are some extensive level swampy areas, and some precipitous topography in glacial sand deposits. There are very few exposures of bedrock. In the original forest solid stands of black spruce and spruce mixed with jackpine predominated. There were also fairly extensive stands of mixedwood (spruce, birch, poplar and jackpine) and some patches of pure jackpine. Pulp cutting in the vicinity of the plot began about 1944. The plot was logged regularly from 1945 until 1951, and irregularly thereafter. By 1959, 43% of its area was classified as cutover, and a logging operation was conducted in an additional 4% during the winter of 1959/60, while this study was in progress. Merchantable timber has been removed from about 80% of the plot, the remainder being an untouched area of coniferous and mixedwood in the northwest quarter.

Detailed examinations were made of some timber types by means of ground surveys. The number and size of stems were recorded on tenth-acre plots placed at four chain intervals along compassed cruise lines. The results, converted to stems per acre, are shown in Table III. The presence or absence of fresh browsing on the plots was also noted, but because the work was done in mid-winter, it is of little significance. A Passmore-Hepburn type browse survey was conducted in two classes of cutover in May, 1960, the results of which will appear in a separate report.

Population changes during the period of the survey

Table I shows the observed and estimated moose population on the plot during the period of the study. Because the project was also designed to test censusing under various conditions, counts of moose were sometimes poor, therefore the difference between moose observed and the estimated total of moose on the plot is considerable for some flights. The method of arriving at estimated totals is described in the report referred to above.

Members of the Geraldton staff engaged in moose censusing in the past have observed that in the area in which the plot was situated moose seem to favour cutover areas in the early part of the winter, but gradually move out of them as spring approaches. The writer and others have noticed similar behaviour in a large burn in the Cogama District. Table I shows that a build-up of moose in the area during December was followed by a decline beginning in the middle of February. In the 1959 hunting season (October 1 to December 24) the plot was heavily hunted by road, water and on foot. Approximately 100 moose were killed from the 80 miles of private roads in the Goldfield Road system, and a fair estimate of the kill within the plot is eight or ten animals. Despite the removal of several moose and the disturbance caused by hunters, the density exceeded one animal per square mile soon after the close of the hunting season. Part of the late winter reduction in numbers might be attributed to

mortality, although no dead moose, which likely would have been pinpointed by raven activity, were seen from the air. It appears, then, that the plot (an area of large openings intermixed with patches of good cover) held more appeal for moose in December and January than in late winter.

The average density (observed) of moose on the plot (1.4 square miles per moose) was nearly double that found in the District as a whole in the 1958-59 census. Most of the plots in that census were located in unlogged country.

Within the experimental plot itself, the late winter shift to heavier cover is apparent in the increase in moose in the uncut northwest sector from 4% of the total observed in December and January to 16% in March.

Utilization of timber types by moose

Table IV attempts to measure the degree of utilization of the various timber types as winter progressed. Observations are broken down into three periods of the winter, during each of which six census flights were made.

Cutover

Since moose food changes with the interval of time since cutting was done this category is divided into three age classes, and the 1945-50 class is further divided into "light" and "normal or heavy" cutting to allow for two tracts where logging was of a selective nature in a mature mixedwood stand. Similarly, an area where logging was in progress during the experiment is also dealt with separately because of the effect of human activity. It is realized, however, that this breakdown accounts for but a few of the variables involved. Soil, aspect and the nature of the original forest undoubtedly play a large part in deciding the quality and quantity of moose food that will rise in the wake of logging.

During the three census periods from 69% to 75% of the moose observed were in the 47% of the plot classified as cutover. Considering that many more moose seen in heavier cover were resting between feeding forays into cutover, the preference for cutover is clearly demonstrated. Among the different cutover classes, the greatest densities (from 30 to 60 acres per animal observed) of moose were found in the areas logged lightly between 1945 and 1950. The make-up of this type (see Table III), a mixture of mature trees and shrubs such as mountain maple and hazel, provided both food and cover in abundance.

Among the other classes of cutover, the parts logged in 1950-55 were favoured over the older and newer classes, although the ten to fifteen year-old cuts, being more extensive, revealed a larger total of moose, except in late winter. Perhaps after ten years a cutover in this area begins to lose its appeal for moose, The youngest class (1955-59) was heavily utilized early in the winter, but as snow deepened shrubs were buried, and the moose left it entirely. The section where logging was in progress was not used by moose.

Although tracks showed that two or three wandered through it, none stopped very long to feed nearer than a quarter of a mile from the area of activity.

Peterson (North American Moose, 1955) in discussing the effects of logging on moose range suggests that the type of logging most favourable to moose lies somewhere between clear cutting and selective cutting. In this case, the most intensively logged areas were little frequented by moose, but these had been uniform stands of pure black spruce, and the growth that follows this kind of forest is usually not as abundant or as varied as grows in drier sites, so it would be difficult to say whether it was cover or food that was lacking. The selectively cut area provided an abundance of food and cover, again due as much to the nature of the site as to the type of logging. It is safe to say, nevertheless, that in the Geraldton District almost any kind of logging temporarily improves the quantity and quality of moose food, and therefore tends to increase the moose population, other factors permitting.

Mixedwood

Mature and over-mature mixed stands consistently revealed good densities of moose. Although no ground work was done in this type, it is likely its composition is similar to that of the lightly logged type, where stem counts were conducted. The proportion of moose found in older mixedwood increased steadily as winter progressed. Observations supported the belief that over-mature mixed wood in association with stands of black spruce is highly important to moose in the Geraldton District.

Coniferous

Few moose were seen in the large, solid stands of mature and medium aged black spruce at any time, but as winter progressed islands of mixedwood in the coniferous stands in the northwest sector of the plot revealed an increasing proportion of the moose observed. Although these observations are credited to other types in Table IV the surrounding coniferous forest probably had a bearing on the presence of moose there.

Only two moose were seen in the 5% of the plot classed as stagnant spruce. Other types of coniferous (jackpine, jackpine and spruce) did not constitute large enough areas to be significant.

Hardwood

Only about one percent of the plot was hardwood, therefore analysis of its importance to moose is not possible.

Composition of the moose herd

A total of 323 individual observations of moose were recorded during the experiment (see Table V), an average of 18 per flight. In

December calves were easily recognized. As they grew larger, difficulty in distinguishing them was offset to a fair degree by the familiarity of the navigator with the various groups of moose, particularly cows with calves, which tended to move very little between censuses. Cows with calves had an average of 1.2 apiece. The prominence of calves in the herd (30% of all animals) suggests that the reproduction rate in that area was high in 1959.

The high incidence of cows with calves (35% of all adult moose) might reflect an unbalanced sex ratio in favour of females. More than two antlered moose were seen on only one occasion, the 17th, of December, when four of fourteen adults carried antlers. In December 16% of all moose seen had antlers, and from January 4 to March 7, when the last antlers were seen, antlered animals accounted for 7% of the total. A shortage of bulls might be a result of the heavy hunting pressure which has been exerted in the vicinity of the plot in recent years.

Movements of individual moose

Snow depth during the winter was about normal; it accumulated gradually to reach a peak of 28 inches on February 9, and had dropped back to 24 inches by April 1. Snow probably did not affect movements of moose abnormally.

The frequency of the census flights made it possible to trace movements of many moose. In the case of adults, positive identification on more than few flights was difficult due to wandering and the forming and breaking up of groups. Cows with calves, however, were easy to identify and they tended to confine their wanderings to relatively small areas. The movements of six sets of cows and calves are shown on Map II. One cow and single calf spent the entire sixteen week period in an area of about one square mile. The others were observed for shorter periods and ranged more widely. Many more sightings of the latter were undoubtedly made, but where there was doubt as to which set an observation represented, it was not included on Map II.

Worth noting are the following records, not included on Map II, involving five or less sightings.

Description	Period Observed	Area Occupied
bull, and from one to four antlerless adults	28 days	600 acres
single adult	27 days	400 acres
bull and antlerless adult	21 days	400 acres
bull, cow and calf	18 days	100 acres

Description	Period Observed	Area Occuppied
antlerless adult	14 days	80 acres
bull and antlerless adult	12 days	100 acres

The group containing the calf frequented the plot margin, and observations ended when they left the plot area. Groups containing adults only inevitably broke up or moved too far to be recognizable, within a month. It appears that cows with calves may spend the entire winter in a few hundred acres, while adults without calves range over many square miles.

Summary and conclusions

Repeated censusing of a tract of cutover land near Geraldton lent support to a belief that while moose favour such open range during the first half of the winter, they tend to move to heavier cover in February and March. Of a variety of classes of cutover, moose appeared to prefer the most lightly disturbed stands. A high proportion of the moose seen during the winter were calves, and a possible shortage of bulls was noted. Movements of certain individual animals were traced for periods of up to sixteen weeks.

The rapidity with which moose moved into the area during December demonstrates the attraction cutover land holds for this animal in the Geraldton region, and the high hunting pressure a section such as that serviced by Kimberly-Clark's Goldfield Road can support without depleting the moose. This pulp and paper company is changing the ecology of a sizable portion of the Geraldton District, generally in a direction favourable to moose. It might be argued that an agency which causes a wildlife resource on public lands to increase bears the responsibility of permitting the excess to be utilized. But moose hunters can be a hazard to workers, they obstruct traffic and damage the property of a timber operator, and for this reason many companies in Ontario exclude them from their timber limits. Kimberly-Clark, however, has been exceedingly generous in this respect, permitting hunters almost unrestricted use of its extensive road system. It is estimated that this company could have reduced the 1959 hunter kill of moose in the Geraldton District by nearly 20%, simply by closing its gates. It is important to moose management to have this situation continue. Kimberly-Clark and other operators who accept the burden of moose hunters as a courtesy or a public relations measure should be made aware of the full significance of their action. And the Department in turn should miss no opportunity to inform hunters using private roads that the privilege they enjoy is not irrevocable.

TABLE I

MOOSE POPULATION DEC. 7, 1959-April 1, 1960

MOOSE OBSERVED _____

ESTIMATED TOTAL MOOSE ON PLOT _ _ _ _ _ _

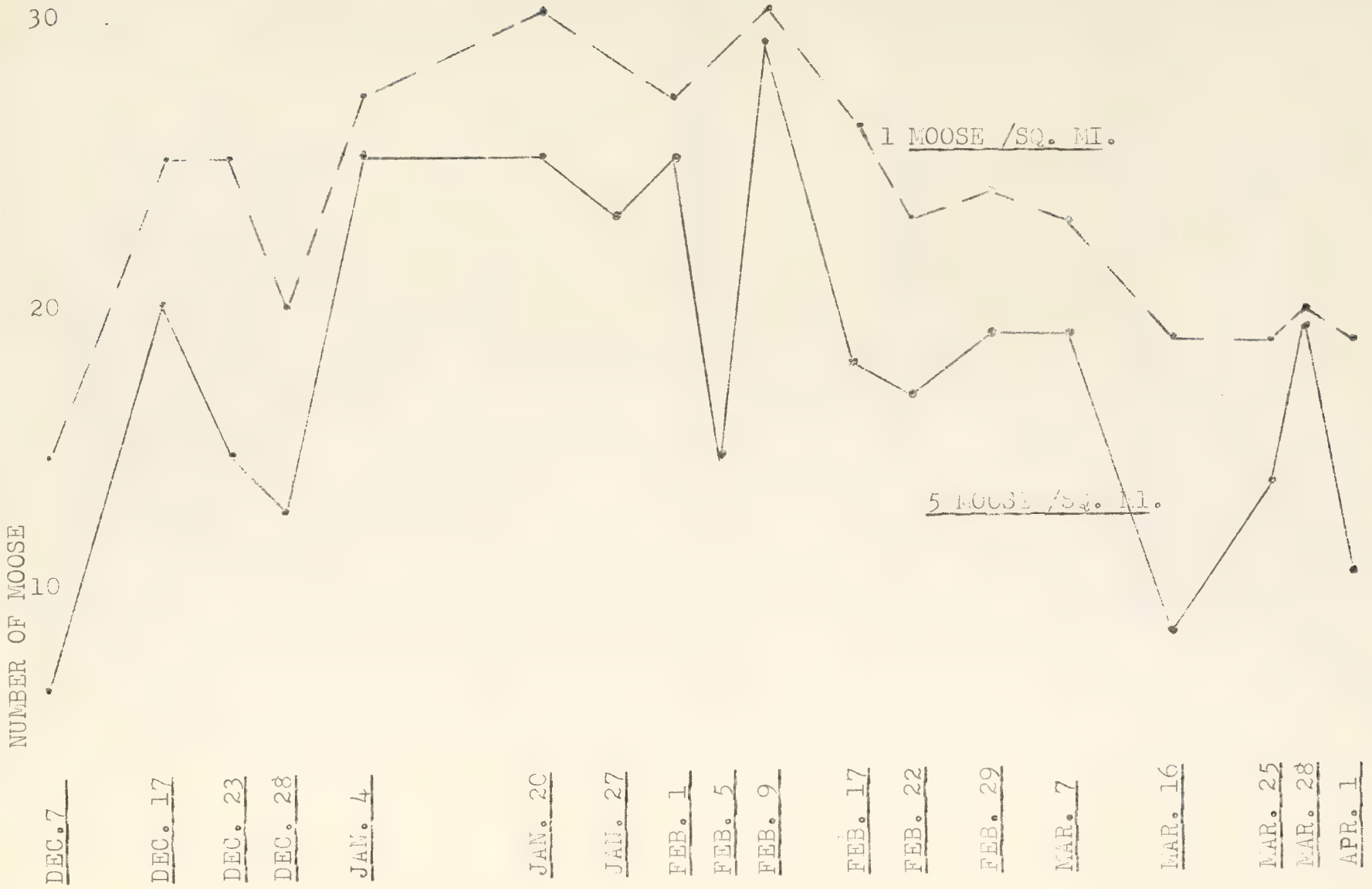


Table II

Distribution of timber types

	Number of Stands	Total Acreage	Average size of Stands	Percent of plot
Cutover 1945-50	16	3638	227 ac.	22.9
" " (light)	2	780	390 "	4.9
Cutover 1950-55	4	1520	380 "	9.5
Cutover 1955-59	5	945	189 "	5.9
Logging in progress	1	635	635 "	4.0
Mixed wood mature	14	1345	96 "	8.4
Mixed wood medium	3	154	51 "	1.0
Mixed wood young	8	230	29 "	1.4
Black spruce mature	28	2300	82 "	14.5
Black spruce medium	31	1345	43 "	8.4
Jackpine mature	10	360	36 "	2.3
Jackpine medium	4	6	1.2"	.03
Jackpine young	14	6	0.5"	.03
Spruce & Jackpine mature	5	180	36 "	1.1
Spruce & Jackpine young	23	135	6 "	.8
Hardwood mature	2	125	62 "	.8
Hardwood medium	4	34	8 "	.2
Hardwood young	5	30	6 "	.2
Stagnant Spruce	15	810	54 "	5.0
Burn (1949)	1	12	12 "	.05
Marsh	10	80	8 "	.5
Alder	2	12	6 "	.06
Lakes	23	1100	48 "	6.9
TOTALS	230	15,900		

Miles of stream: 14.6

TABLE III

COMPOSITION OF SOME TIMBER TYPES (STEMS PER ACRE)

	Cutover 1945-50 (Heavy) Sample size 3.0 Acres			Cutover 1945-50 (Light) Sample size 0.9 Acres			Cutover 1950-55 Sample size 2.1 Acres			Black Spruce (Medium Age) Sample size 1.0 Acres		
	-6'	6'-20'	20'+	-6'	6'-20'	20'+	-6'	6'-20'	20'+	-6'	6'-20'	20'+
JACKPINE	27	13	8			1	25	1	2			6
TAMARAC	1						1			17	1	
WHITE SPRUCE												
BLACK SPRUCE	251	64	28	66	63	74	102	35	21	242	182	488
BALSAM	80	24		177	23	19	4	3	7	1		
CEDAR		1								10	15	24
WHITE BIRCH	261	73	28	289	56	86	80	17	26	5		8
TREMBLING ASPEN	70	110	33	55	28	11	386	251	16			
LARGE TOOTH ASPEN							1					
BALSAM POPLAR	3	1					28					
BLACK ASH				73	31	37						
WILLOW	200	6		133	1		376	80		120	8	
BOG BIRCH										92		
ALDERS	1296	98	1	664	106		503	64		1201		
RIBES	3											
JUNEBERRY	17			84			61					
RASPBERRY	43						25			1		
ROSE	2											
PINCHERRY	80	14					81	2				
MOUNTAIN ASH	202	23	1	15	7		16	3		8		
DOGWOOD							12			8		
HAZEL				518			588	44				
ELDER	41	5		200	11							
MOUNTAIN MAPLE	18			771	34		132	27				
% of plots with fresh browsing		47%			44%			62%			10%	

TABLE III Cont'd

COMPOSITION OF SOME TIMBER TYPES (STEMS PER ACRE)

	Black Spruce (Mature) Sample size 1.0 Acres			Black Spruce (Stagnant) Sample size 0.2 Acres			Jackpine - Spruce (Mature) Sample size 0.2 Acres			Mixed wood (Mature) Sample size 0.5 Acres		
	-6'	6'-20'	20'+	-6'	6'-20'	20'+	-6'	6'-20'	20'+	-6'	6'-20'	20'+
JACKPINE			2						385			
TAMARACK				5								
WHITE SPRUCE												
BLACK SPRUCE	8	47	161	185	280	865	130	180	540		8	24
BALSAM										44		2
CEDAR												
WHITE BIRCH											38	48
TREMBLING ASPEN										2	20	20
LARGE TOOTH ASPEN												
BALSAM POPLAR										2		12
BLACK ASH												
WILLOW	77						15				2	2
BOG BIRCH							5					
ALDERS	152	44								518	224	48
RIBES												
JUNEBERRY										10	10	
RASPBERRY							5			4		
ROSE												
PINCHERRY												
MOUNTAIN ASH										42	28	24
DOGWOOD												
HAZEL										16		
ELDER												
MOUNTAIN MAPLE										640	114	
% of plots with fresh browsing		20%			0%			0%			0%	

Table IV

Moose observed in each timber type by periods

	DEC 7 to JAN 20			JAN 27 to FEB 22			FEB 29 to APR 1		
	Number of Moose	Acres per Moose	% of Total	Number of Moose	Acres per Moose	% of Total	Number of Moose	Acres per Moose	% of Total
Cutover 1945-50	34	107	32.4	33	110	26.0	22	165	24.2
" " (light)	13	60	12.4	26	30	20.5	18	43	19.8
Cutover 1950-55	16	95	15.2	20	76	15.7	23	66	25.3
Cutover 1955-59	17	55	16.2	9	105	7.0	0	---	----
Logging in progress	0	---	----	0	---	----	0	---	----
Mixed wood mature	7	192	6.7	18	75	14.2	16	84	17.6
Mixed wood medium	5	31	4.8	1	154	.8	0	---	----
Mixed wood young	0	---	----	2	165	1.8	1	230	1.2
Black spruce mature	3	766	2.8	11	209	8.7	3	766	3.3
Black spruce medium	6	224	5.7	3	338	2.4	0	---	----
Jackpine mature	0	---	----	1	360	.8	1	360	1.2
Jackpine medium	1	6	1.0	1	6	.8	1	6	1.2
Jackpine young	0	---	----	0	---	----	0	---	----
Spruce & Jackpine mature	0	---	----	0	---	----	2	90	1.6
Spruce & Jackpine young	0	---	----	0	---	----	0	---	----
Hardwood mature	1	125	1.0	0	---	----	0	---	----
Hardwood medium	0	---	----	0	---	----	3	11	3.3
Hardwood young	0	---	----	1	30	.8	1	30	1.2
Stagnant Spruce	2	405	1.9	0	---	----	0	---	----
Burn (1949)	0	---	----	0	---	----	0	---	----
Marsh	0	---	----	1	80	.8	0	---	----
Alder	0	---	----	0	---	----	0	---	----
Lakes	0	---	----	0	---	----	0	---	----
	105			127			91		

Table V

SUMMARY OF MOOSE OBSERVED

	ANTLERED ANIMALS	COWS WITH CALVES	CALVES	UNIDENTIFIED *	TOTAL
MOOSE	24	79	96	124	323
% of Total	7.4%	24.5%	29.7%	38.4%	

* Mostly antlerless adults, but it might include some calves in late winter.

GAME INVENTORY IN THE U. S. S. R.

by
Anonymous

Translated by Walter Plonski
From WILD und HUND (in German)
August 21, 1960, P. 350

Abstract

This paper discusses how game inventories are taken from the air in the USSR. It was concluded that this type of inventory was successful for moose, black game and fox, but almost impossible for deer and wolves, except in open land.

Game inventory from the air was carried out in the USSR, in the vicinity of Smolensk, during February and March, 1957.

For this purpose an aircraft of a type PO-2 has been used, which in four to five hours' time covered a distance of 400 km. During the flight some 45,000 ha. (1 hectare = 2.471 acres) were covered.

The tally has been carried out by two persons. These took care of typing the area, the length of visualized strips, as well as the species and the number of the encountered game. Later on the number found on a type has been prorated for the total type area. In this way the total inventory of the respective game has been estimated. The first inventory has been carried out for moose, for deer, for wolf, for fox, as well as for black game and Hungarian partridge.

The speed of aircraft was between 80 to 90 km. per hour. The flight height was from 75 to 125 m.

From practical experience, it has been known that the width of a strip while counting moose in open forest condition was 400 m., and in open land up to 700 m. Tallying wolf, fox, and deer was at that height possible only in open stands and open land up to 300 m. width of the strip. Less difficult was the counting of black game which, with aircraft approaching, usually took off some 250 m. and made counting possible.

The inventory of deer from the aircraft was almost impossible. Comparing the results of this attempt with the regular inventory, it has been experienced that this method is good only for moose, black game and fox.

A BIOLOGICAL SURVEY OF TROUT LAKE KENORA DISTRICT, 1959

by
B. Gibson

Abstract

A biological survey of Trout Lake, Kenora District was conducted August 27-28, 1959. This involved netting, collecting scale samples, measurement of fish and stomach analyses. Oxygen content, thermal conditions and water transparency of the lake were also tested. Conclusions reached indicated that Trout Lake is a lake of low fertility. Forage fish numbers appear to be restricted due to the scarcity of plankton. Although the lake trout examined showed a reasonably good growth rate, the absence of young lake trout in the gill nets may indicate a decline in reproduction. It is recommended that a summer creel census be undertaken and that no speckled trout be stocked at the present time since lake trout and pike already present would provide severe competition for the establishment of the trout.

Purpose of Survey

This survey was conducted at the request of the Trout Lake Campers' Association, which body voiced the opinion that fishing during the past twenty years has been poor in this body of water. They also requested that adult speckled trout be planted in Trout Lake on this account.

Procedure of Survey

The survey was conducted on August 27 and August 28, 1959. Data were collected by the District Biologist, with the assistance of the local Conservation Officer.

Fish samples were collected by means of two gangs of gill nets, consisting of net lengths of various mesh sizes as follows:

Gang 1	- 2 1/4" mesh -	75 feet
	- 2 3/4" mesh -	50 feet
	- 3" mesh -	125 feet
	- 3 1/2 mesh -	100 feet
	- 4" mesh -	100 feet
	Total	450 feet

Gang 2	- 2 1/2" mesh	- 60 feet
	- 3" mesh	- 90 feet
	- 3 1/2" mesh	- 60 feet
	- 6" mesh	- 60 feet
	Total	270 feet

All mesh sizes indicated refer to extension measure. For the locations of the two net sets refer to the map.

Each fish captured was measured for total length to the nearest one-tenth inch and weighed to the nearest half-ounce. Stomach contents were analyzed for individual members of carnivorous species; the sex of each fish taken was determined and scale samples were collected for subsequent age determinations.

A Taylor maximum-minimum thermometer was used to determine thermal conditions in the lake, and the character of the lake basin was established through the use of a Bendix echo sounder.

Water transparency was established by means of a Secchi disc.

Four seine hauls were undertaken at a sandy beach on the north shore of the lake to sample the small fish population.

Physical Properties of the Lake

Trout Lake is a characteristic oligotrophic (poorly nourished) lake, situated approximately twenty miles west by northwest of the town of Kenora, in Gidley township.

There is one small stream flowing into the northern portion of the lake which is reduced to a mere trickle during hot-weather periods. A small outlet flows from the southeast corner of the lake into Rosina Lake; this water drains through a series of lakes and eventually reaches the Winnipeg River system.

The maximum length of the lake is approximately 2 1/4 miles and its maximum width is 7/8 of a mile. A western narrow extension is separated by shallow water (15 feet in depth) from the deeper main body of the lake. The maximum depth of the lake is 105 feet; its average depth is estimated to be 40 feet.

A large area of the lake has a sandy bottom but the deeper pockets contain cumulative deposits of muck. Rocky shoals are also present in some parts of the lake.

The water in Trout Lake is extremely clear, with Secchi disc visibility being 21 feet on August 27.

A sharply-defined thermocline existed between 25 and 30 feet with the temperature plunging from 70°F to 54°F within this five-foot stratum. The histogram on page 54 illustrates the thermal structure of the lake on August 27, 1959.

An oxygen determination for a water sample taken at the 60 - foot level produced evidence of 8 p.p.m. dissolved oxygen (sub-thermocline area.)

Thirty-nine of forty-four lots in the Trout Lake Cottage Subdivision have now been sold. The northeast shore of the lake has the most concentrated development, with many cottages now present as well as one tourist establishment and a lakeside park administered by our Department.

Biological Properties of Trout Lake

A total of six species was represented in the catches from the two gill net sets and four seine hauls which were undertaken. Time did not permit additional gill net sets to be effected, hence adequate coverage of the lake was not realized, particularly in the shallower water areas.

Six lake trout (Salvelinus namaycush) were taken in set number one and seven lake trout and one northern pike (Esox lucius) were netted in set number two. The lake trout show an average rate of growth for the Kenora District. No coarse fish or perch were taken in either set.

The predaceous fish catch is represented below: (Weights in pounds)

Species	Number	Total Weight	Average Weight
Lake Trout	13	31.7	2.4
Northern Pike	1	5.0	---

Stomach analyses of the two carnivorous species indicate that, of the thirteen trout, six contained unidentifiable fish remains; five stomachs contained whole tullibee (Leucichthys artedi); one stomach contained partially desiccated insect remains, and the other contained crayfish remnants. The tullibee appears to be the main forage species utilized by the trout and average four inches in length. The only northern pike specimen contained a single small perch.

The six lake trout caught in the one net and seven captured in the second indicate an average catch per unit of effort for a lake such as Trout Lake. The single northern pike caught is not likely a good index of its abundance in comparison with the lake trout.

The four species captured in the seine hauls were as follows: Johnny Darter (Boleosoma nigrum), Common shiner (Notropis cornutus), Spottail shiner (Notropis hudsonius) and Yellow perch (Perca flavescens).

Species	Number Caught	Percentage of Total
Johnny Darter	87	65.9
Common Shiner	37	28.1
Spottail Shiner	6	4.6
Yellow Perch	2	1.4

The average length of the Johnny darters was about 1 1/2 inches; the spottail shiner and common shiner averaged one inch in length.

Conclusions and Recommendations

Trout Lake is a lake of low fertility. However, the thirteen lake trout specimens taken in the two gill net sets appear to be in reasonably good condition with regard to growth rate. The lack of coarse fish in the gill net sets is not surprising, due partly to the short duration of the study and the probability that they do not frequent the deeper water areas to the same degree as the lake trout do in August.

Due to the absence of young lake trout in the gill net sets, there is a possibility that reproduction mayhave declined in Trout Lake. It is felt that an inadequate number of lake trout were taken to verify this hypothesis. If reproduction has deteriorated, no opinion is ventured as to the reason. Further study of the lake is felt necessary to validate or disprove this theory.

As shown by the map, the areas suitable for trout during the summer are somewhat restricted. Because of the low fertility of Trout Lake, there appears to be little in the way of plankton which provides food for the forage fish, and possibly their numbers are restricted as a result. In turn, the trout population may be confined, due to lack of forage fish.

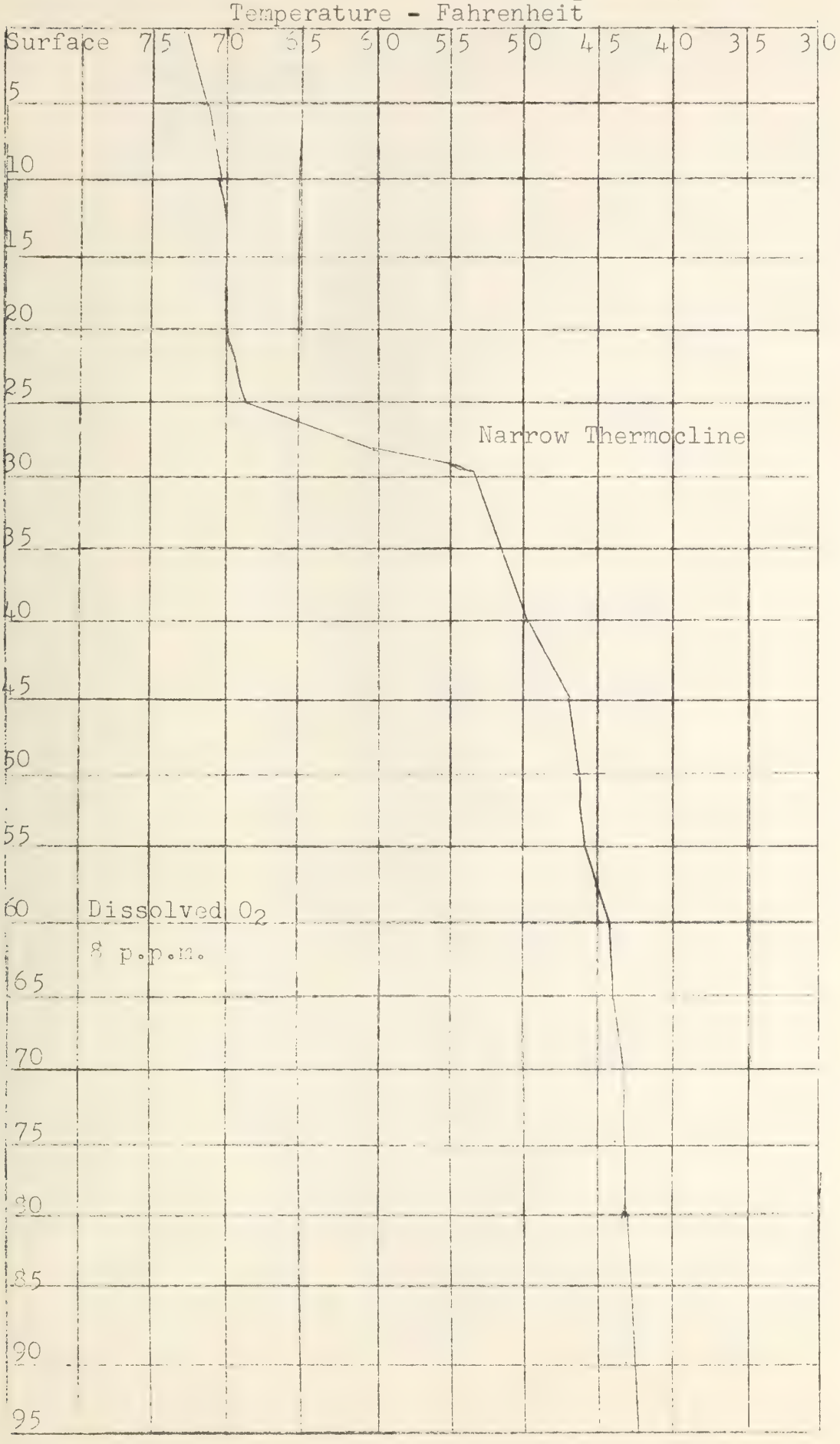
In view of the survey findings, the following recommendations are made:

1. That a summer creel census of Trout Lake be undertaken with scale samples taken for subsequent study. The creel census is needed to determine angling pressure, species preference and yield of fish for future comparisons.

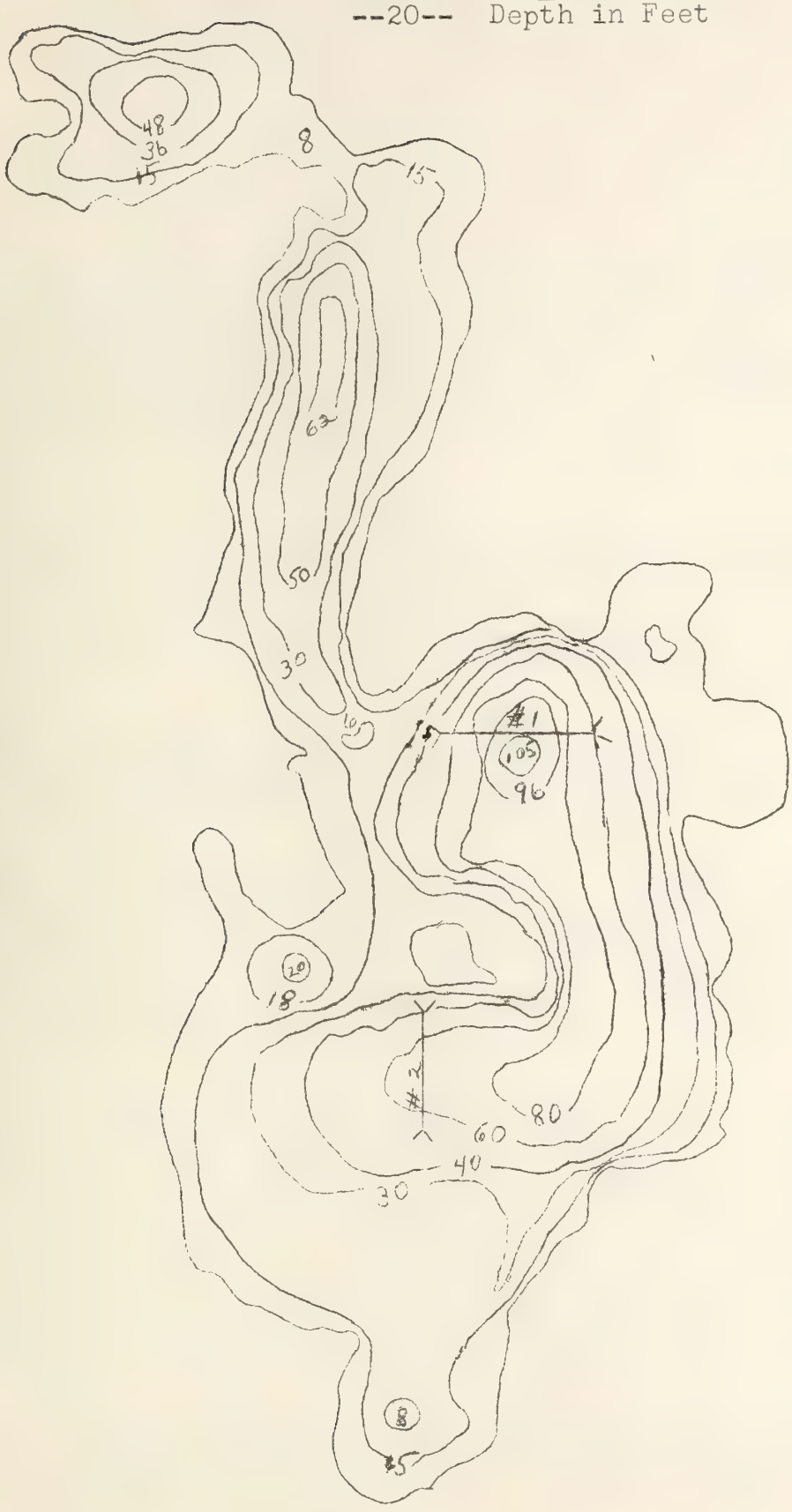
2. That adult speckled trout not be stocked in Trout Lake at the present time. It is likely that the lake trout and pike already present would provide severe competition for the establishment of speckled trout. A more detailed chemical and biological analysis of Trout Lake would indicate probably that stocking of this lake with adult speckled trout would be impractical.

Thermal Conditions Trout Lake - August 27, 1959

Temperature - Fahrenheit



TROUT LAKE
Scale: 4" = 1 mile
--20-- Depth in Feet



RECAPTURE OF A TAGGED RANBOW TROUT FROM MICHIGAN IN NORTHUMBERLAND COUNTY, MAY 23, 1959

by
K. K. Irizawa

Abstract

The recapture of a Rainbow Trout in Haldimand Township, Northumberland County, Ontario on May 23, 1959 is reported. This fish which had been tagged and released at the Ocqueoc River, Presque Isle County, Michigan on May 20, 1957 had travelled approximately 600 miles by water from the point of release.

A Rainbow Trout bearing a Michigan tag No. 4812 was caught on May 23rd, 1959 in Shelter Valley Creek, Haldimand Township, Northumberland County, by Mr. J. Ainsworth, R. R. #1, Grafton, Ontario. It was reportedly 26½ inches long and weighed approximately 5½ pounds at the time of capture, but these measurements have not been confirmed.

Upon communication with the Michigan Department of Conservation, we have been advised as follows by Mr. Thomas M. Stauffer in charge of Sea Lamprey Research, Marquette Fisheries Research Station, State Fish Hatchery, Marquette, Michigan.

"This was a hatchery-reared fish 7.5 inches long weighing approximately 3 ounces when it was tagged and released at the Ocqueoc River, Presque Isle County, on May 20, 1957. It was caught at a distance of about 600 miles (by water) from the point of release. This Rainbow Trout is one of several recovered in the Lake Ontario area that had been originally planted in Carp Lake River, Emmet County and the Ocqueoc River, Presque Isle County.

In 1955-1959, over 100,000 tagged Rainbow Trout have been released in Michigan tributaries of the Great Lakes. As you can no doubt see, these fish have ranged widely from the original planting site. Migrations of more than 100 miles were relatively common and 36% of the reported recoveries were recaptured at sites other than the release site.

Although the planted Rainbow Trout showed very rapid growth, only about 3% of the planted fish were known to be recovered by anglers."

This is not the first instance of long distance travelling Rainbow Trout. On page 31 of the September-October 1960 edition of Sylva is recorded a Rainbow Trout from the same waters having been caught in the Bay of Quinte.

HILL'S LAKE HATCHERY
EXPERIMENT #8 SUPPLEMENT -
FISH TRANSPORTATION METHODS

by
N. D. Patrick

Abstract

Experimental work on fish shipping methods is continuing at Hill's Lake Hatchery, and this report covers an attempt to increase truck capacity by using a buffer to stabilize water acidity. The experiment was a failure because the fish were not crowded enough in spite of the fact that some tanks were carrying well over twice the "normal" load. It is obvious that our present truck shipment method (at least from Hill's Lake) is inefficient and requires study.

Introduction

Most of the planning and experimental work with buffers, plastic bags and anaesthetic done to date has been aimed at increasing aircraft payload. (Macins 1960, Patrick 1960)*. There is, however, a possibility that the application of these methods to conventional truck shipping techniques may also increase payload, and for this reason, the present experiment was undertaken. We have already applied the plastic bag method to shipments by car, using a portable soft-drink "cooler" with considerable success. There is every reason to believe that proper use of drugged water for shipping fish will make the large hatchery truck obsolete as far as fish plantings are concerned, a small pick-up truck being adequate to do most planting work. Transferring large quantities of fish from one hatchery to another would probably still require a large truck but fewer trips would be required.

Objective

To assesstruck carrying capacity and study the effect of buffering the water.

Method

The experiment was carried out with a shipment of two-year old speckled trout from Hill's Lake Hatchery that were sent to the Hornepayne Road area in Kapuskasing District.

The normal method of shipping involves a three-ton truck loaded with eight steel water tanks. These tanks are 36" square and about 30" deep with baffles around the top edge to prevent water loss from splashing. They are equipped with wooden lids with an ice pan in each lid. Each tank is fed oxygen from a system utilizing compressed oxygen fed into the water through gas diffuser stones.

* See Fish and Wildlife Mgt. Rept. No. 54, 1960.

Each tank is filled to about 14" depth with water, giving a total volume per tank of approximately 65 gallons. The load for a trip such as this (10 hours at least) was estimated by the hatchery staff at 250 two-year old fish per tank. This gives a loading of 3.8 fish or 0.69 lbs. per gallon, 45 lbs. of fish per tank - a total truck-load of 2,000 fish weighing some 364 lbs. These are, obviously, large, "legal size" fish, and this loading was considered to be the maximum that could safely be carried on this particular planting.

In order to assess the effectiveness of the buffer, the tanks were set up in four pairs, one of each pair filled with normal water and the other filled with buffered water. Four different loads were placed in the four pairs of tanks so that loads of 4 fish/gallon, 6 fish/gallon, 8 fish/gallon and 10 fish/gallon were carried. The heaviest load carried some $2\frac{1}{2}$ timesthe "normal" load.

Each tank in the buffered series contained 65 grams of tris-buffer, giving a dosage rate of 1 gram per gallon.

Loading of the fish started at 4:00 a.m. on June 14th, 1960, and the truck left the hatchery at 5:00 a.m. Periodic checks of fish condition, pH and temperature were made throughout the trip. A fresh supply of ice was obtained at 10:30 a.m. in Kapuskasing, but by 2:15 p.m. the ice supply was gone and the supply of oxygen was almost exhausted. The fish appeared to be suffering in all tanks by 2:30 p.m. and so planting was carried out. As fish showed signs of distress from oxygen lack after the oxygen supply ran out, the tank water was hand aerated using a pail.

Observations

Records of pH and temperature taken during the trip are recorded in Table I. No mortality was observed, but fish were obviously suffering in all tanks by the time planting was started and intensity of suffering varied with the number of fish in each tank. Heavily loaded tanks showed suffering fish as soon as the oxygen supply ran out and hand aerating of the tank water was necessary to keep the fish alive. The amount of aeration required varied also with the number of fish in each tank and the increase in water temperature from Tank #1 to Tank #8 (recorded at 3:30 p.m.) indicates this since splashing the water through the warm air tended to increase water temperature. There was no noticeable difference between the condition of fish in normal water and buffered water, but it was observed that the buffered water became dirty from fish excrement much sooner than the normal water.

Water in all tanks became extremely dirty from fish excrement so that by 5:30 a.m., it was difficult to observe fish accurately on the bottom of the tanks. These fish had been starved for a day prior to shipping, but their last feeding was of meat - which is digested slowly.

No record of initial pH of the water is available since it was beyond the range of the pH kits in the case of buffered water (over 8.8) and in any event, there was insufficient daylight to obtain readings. The normal hatchery water has a pH of 8.3 and 1/4 gram

buffer per gallon raises the pH beyond 8.8. In all buffered tanks, the pH dropped to around 8.0 by 6:45 a.m.

Number of Fish
Buffer - Gms.
Loading Time

DATA RECORDED
Temp. in °F

Time	Air Temp. of	Tank #1	Tank #2	Tank #3	Tank #4	Tank #5	Tank #6	Tank #7	Tank #8
-	-	260	260	390	390	520	520	650	650
-	-	-	65	-	65	-	65	-	65
Loading of Tank #1 Started at 4:00 a.m. -- #8 Loaded by 5:00 a.m.									
6:45 a.m.	46	43	44	44	44	44	44	44	44
Temp.	46	7.1	8.2	7.2	7.9	7.0	7.8	7.1	7.8
pH									
8:40 a.m.	55	46	46	46	46	46	46	46	46
Temp.	55	7.2	7.9	7.1	7.4	7.0	7.4	7.2	7.4
pH									
10:20 a.m.	-	49	49	49	49	49	49	50	50
Temp.	-	7.1	7.7	7.2	7.4	7.1	7.4	7.2	7.4
pH									
12:30 p.m.	73	-	-	-	-	53	54	53	54
Temp.	73	-	-	-	-	7.0	7.2	7.0	7.3
pH									
3:30 p.m.	-	56	58	58	60	-	-	60	62
Temp.	-	6.9	7.2	6.8	7.0	6.8	-	7.0	7.2
pH									

TABLE 1: TEMPERATURE AND pH DATA FOR EXPERIMENT #8

The tanks with buffered water showed a consistently higher pH throughout the trip, although neither series showed what could be termed drastic pH change. There does not appear to be any obvious effect of fish numbers on the pH change in either series of tanks. That is, 260 fish in buffered water showed the same and pH as did 650 fish in the same water.

Conclusions

It is not possible to determine any beneficial effect of buffering the water on this particular shipment. It is, however, obvious that the original shipment planned was far below capacity of the shipping equipment.

This conclusion confirms casual observation of other routine shipments. There is no doubt in the writer's mind that the present shipping methods in use at Hill's Lake are not being utilized to capacity. This means that a considerable economy in shipping costs is possible if the maximum carrying capacity can be determined and utilized.

There is, of course, a very real possibility that this situation exists in the operation of other Provincial Hatcheries, and perhaps in them all, and if so, corrective measures must be taken.

Recommendation

It is recommended that standard fish shipping methods be investigated with a view to reducing shipping costs.

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